



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/828,843

04/21/2004

James A. Perkins

56527.C1/ C-3670.0

5307

408 7590 09/23/2008
LUEDEKA, NEELY & GRAHAM, P.C.
P O BOX 1871
KNOXVILLE, TN 37901

EXAMINER

POPOVICS, ROBERT J

ART UNIT

PAPER NUMBER

1797

MAIL DATE

DELIVERY MODE

09/23/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/828,843	Applicant(s) PERKINS ET AL.	
	Examiner /Robert James Popovics/	Art Unit 1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on July 24, 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3-12,14 and 16-33 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3-12,14 and 16-33 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 9/20/07 (Fig. 1) is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

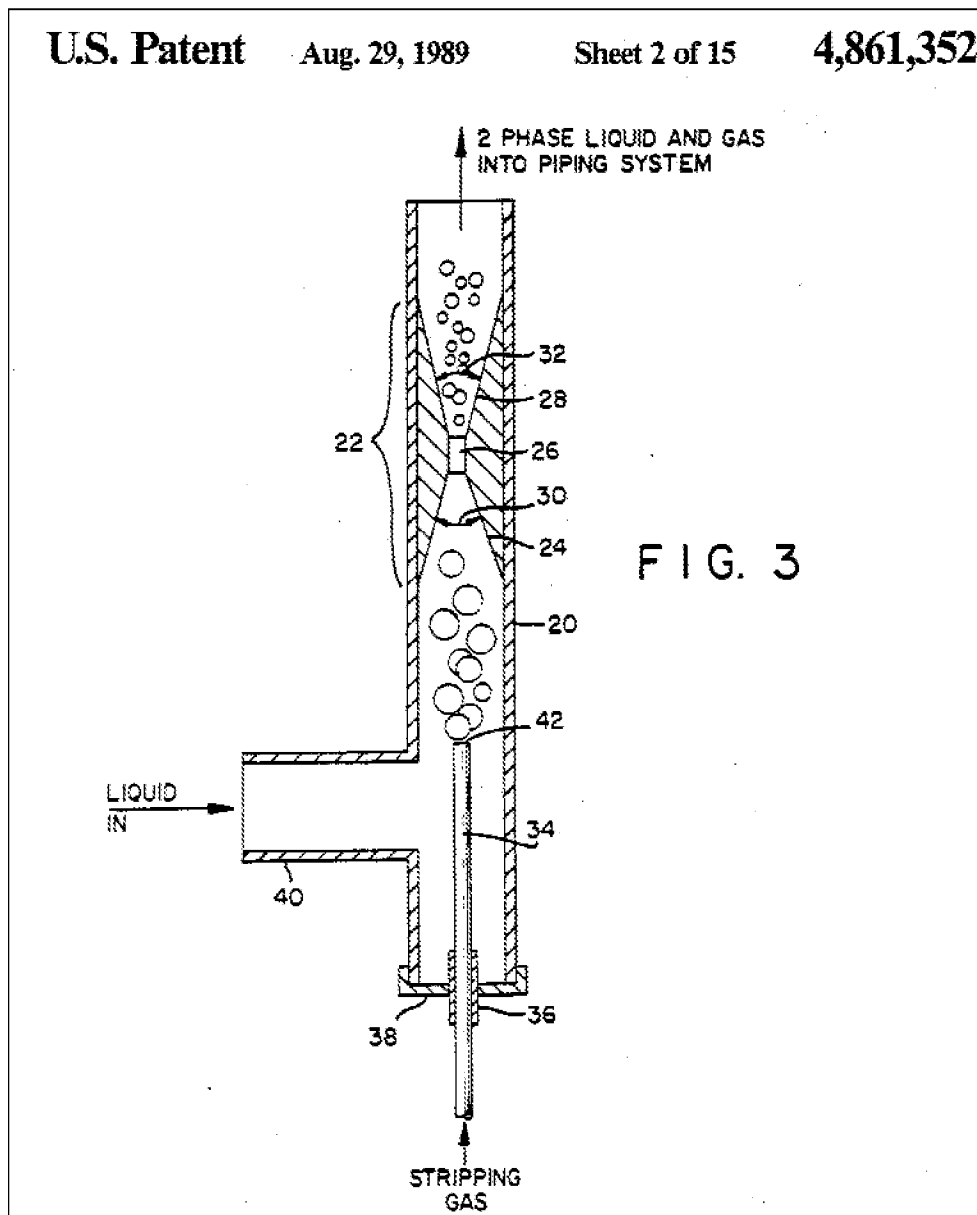
Claim Rejections - 35 USC § 103

Official Notice

Official Notice of the following is taken:

- 1) MTBE is a well known contaminant found in groundwater due to gasoline spills, or leakage from gasoline storage tanks.
- 2) Removal of MTBE and other hydrocarbon/volatile water contaminants using various stripping techniques is well known to those skilled in the art.
- 3) The use of venturis, venturi type devices, entrainment devices, jet pumps, eductors, ejectors, fans, pumps, blowers, motive fluid devices, etc., to generate suction, or create a vacuum, or reduced pressure region, is well known to those skilled in the art.
- 4) The AiRTX™ Air Amplifier is a known, commercially available, prior art entrainment device, that is marketed to create a strong vacuum or to manipulate the velocity of a fluid using compressed gas.
- 5) Application of vacuum, reduced pressure or suction to a liquid having hydrocarbons or volatiles contained/dissolved therein results in those compounds coming out of the water – **Henry's Law**. (*Henry's Law: At a constant temperature, the amount of a given gas dissolved in a given type and volume of liquid is directly proportional to the partial pressure of that gas in equilibrium with that liquid.*)
- 6) The use of multiple stages, or a series of treatment devices in series is well known in the art to multiply the effect of a single stage. Entire college courses (e.g., Unit Operations) are largely devoted to the study of multiple stage separations.
- 7) Those skilled in the art are well aware of Official Notice items 1-6.

Claims 1, 3-12, 14 and 16-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combined teachings of **Cheng (US 4,861,352)** and **AAPA (Applicant's Admitted Prior Art)**. **Cheng** discloses an inline stripper:



Cheng does not appear to expressly disclose ***“establishing a well”*** as recited in independent claim 1, or ***“at least one well extending from the ground surface to a downhole location,”*** as recited in independent claim 12. **AAPA**

teaches that those structures fore and aft the claimed inline stripper are conventional or well known to those skilled in the art.

AAPA teachings:

Those of ordinary skill are believed to be well-versed in the use of the above and other similar subterranean groundwater/ vapor removal technologies in connection with which the invention may be used.

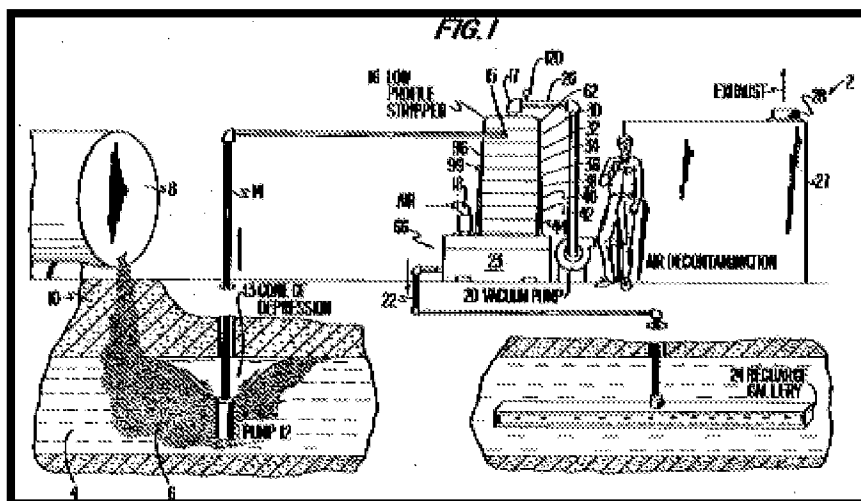
nants. Determination of sizing, depth, and all other relevant parameters in connection with construction and proper operation of the well 12 for withdrawing contaminated groundwater is readily accomplished by any person of ordinary skill in the art. For illustration purposes only for

[0062] Once the extracted fluid has been treated in the stripper 30, the liquid and vapor phase material is conducted, collected and separated as at conduit 50 into a vapor/liquid separator 52. Alternatively, the material processed through the inline stripper 30 may be conducted directly from the expansion chamber portion 36 into the separator 52. The separator 52 may be a conventional “knockout” vessel or drum in which the liquid and vapor phases are caused to separate primarily by means of gravity forces. The knockout vessel may also include an internal mist eliminator to aid in removal of fine liquid droplets from the vapor phase flow. The separator 52 may also be provided as a vessel packed with particulates such as a sand filter vessel where separation is enhanced by flow separation for improved mass transfer. A suitable size for the vapor /liquid separator vessel (in the case of a knockout vessel) is from about 50 to about 200 gals for an extract flow rate of from about 1 to about 20 gpm of liquids and from about 100 to about 1000 cfm of vapors, although it will be appreciated that the separator 52 may be sized by those of ordinary skill in accordance with the flow rates involved in the particular application of the treatment system.

Art Unit: 1797

It is submitted the subject matter of claims **1, 3-12, 14** and **16-33** would have been readily apparent to those of ordinary skill in the art, in view of the combined teachings of **Cheng** and **AAPA**. Those skilled in the art would have readily appreciated that the resultant two-phase stream produced by the device of Cheng could be separated using conventional techniques, such as a “knockout” vessel as taught by AAPA, or by other means conventionally known to those skilled in the art.

Claims **1,3-12,14** and **16-33** are **alternatively** rejected under 35 U.S.C. 103(a) as being unpatentable over the combined teachings of **Rentschler (US 5,352,276)** and **Cheng (US 4,861,352)** and optionally, **AAPA (Applicant’s Admitted Prior Art)**.



As shown in Fig, 1, Rentschler discloses a water remediation system.

From column 11 of Rentschler, beginning at line 5:

The system is particularly useful for decontamination of water contaminated with volatile organic compounds (VOC) which may be introduced to Found water through leakage of a storage tank or the like, as illustrated in FIG. 1. A typical example is a gas station from which VOCs have leaked into the groundwater. Chemical species that make up the contamination include gasoline components, e.g., **MTBE (methyl tert-butyl ether)** and the BTEX compounds (benzene, toluene, ethyl benzene and xylenes) as well as other water insoluble, high vapor pressure compounds.

Rentschler does not disclose a venturi stripper as disclosed by Applicant. Cheng discloses a venturi stripper. AAPA teaches that the components fore and aft the claimed stripper are known in the art.

It would have been readily apparent to those skilled in the art to substitute the venturi-type stripper disclosed by Cheng, into the system of Rentschler, in order to remove contaminants from the liquid being treated, with both strippers being known functional equivalents, serving to strip. Any deficiencies of this combination would have been obvious in view of AAPA or that which is conventionally known to those skilled in the art.

Applicants' admissions are again noted:

Stripping is of course a well-known process of removing gases from a liquid coming up from a subterranean location. Again, Applicants do not claim to have invented the idea of stripping gases from liquids using a venturi.

Response to Arguments

In the **Remarks of July 24, 2008**, Applicants asserted:

Thus, the alleged admissions concede nothing more than what is already apparent in, for instance, the Rentschler patent. Neither the alleged admissions, nor the Rentschler patent, nor any other reference cited by the Examiner discloses or suggest an integrated system as claimed for withdrawing a two-phase flow of groundwater to the surface with an in-line venturi-type stripper to cause VOC's from the liquid phase of the two-phase flow of contaminated groundwater extract brought up to the surface for treatment to be transferred into the vapor phase.

This argument is not commensurate in scope with the claims, and finds no basis in the originally filed specification. The specification does not teach "withdrawing a two-phase flow of groundwater to the surface with an in-line venturi-type stripper." Accordingly, it cannot be found to be persuasive.

Then Applicants argue:

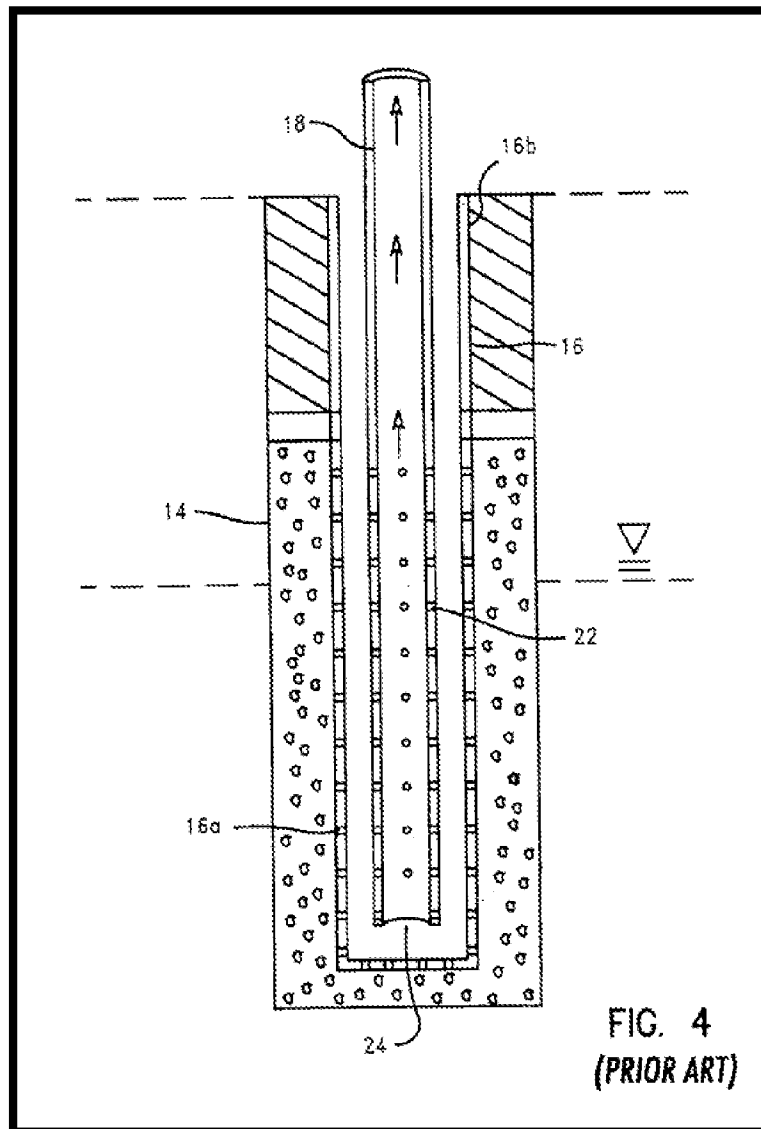
Nothing in the cited art would have prompted one of ordinary skill to combine Cheng's venturi with the remaining cited art in the manner of Applicants' claimed system.

The Cheng reference clearly teaches the use a venturi to strip a gas from a liquid. This is well known in the art. The hypothetical person having ordinary skill in the art is charged with all that is known in the art. Accordingly, the hypothetical person having ordinary skill in the art would have known of such venturi type stripping devices. The substitution of one known stripping device for another is seen to be exceedingly obvious, in the same way that an auto mechanic would know that a car could be jacked up with a floor jack, a scissor jack, a hydraulic bottle jack, or a bumper jack.

It is next argued:

Nothing in the art or in the alleged "admissions" would have suggested the feasibility of liberating groundwater-bound VOC's by inducing a two-phase flow of subterranean groundwater mixed with air/vapors to the surface and then acting upon this deliberately induced two-phase flow with a venturi-type device followed by separation into liquid and gas phases. The Examiner has consistently failed to appreciate this critical distinguishing feature of Applicant's claimed system. Nothing teaches one of skill to purposely apply a venturi stripper to a deliberately induced two-phase flow regime of contaminated groundwater brought up to the surface for the purpose of treating the mixture to separate dissolved VOC's from the groundwater. This is not an obvious approach for achieving such a separation, and the obviousness rejections cannot reasonably be maintained.

Interestingly, it is now argued that a two-phase flow is deliberately induced. It is unclear why one would want to **“deliberately”** induce a two phase flow, when the concern is over contaminated water.



It is submitted that the argued **“deliberate”** two-phase flow is actually an unintended consequence of the design of the conventional well, as illustrated in Applicants' Figure 4. As the groundwater level drops, more holes in the pipe 12 will be exposed to, and suck gas/vapor. This is inherent in the systems of the type depicted in Figure 4 and in conventionally known systems (e.g. that of the references as applied above). Again, it is unclear why one skilled in the art would want to **“deliberately”** induce a **“two-phase”** flow, when only one phase is sought to be used or treated.

Art Unit: 1797

It is noted that Applicants' sole example does not "*deliberately*" induce two-phase flow, but rather, places the inlet opening of the pipe two feet below the groundwater level:

EXAMPLE 1

[0071] A site believed to have groundwater contaminated with methyl tertiary butyl ether (MtBE) from a leaking underground fuel tank was treated by extracting and treating the contaminated groundwater ex situ. An extraction well was formed by drilling a borehole down to the groundwater level of approximately 12 feet below the surface. Initial samples of the groundwater were taken and indicated an average MtBE concentration in the well of about 29,000 parts per billion (ppb). A one-inch diameter extraction pipe was placed in the well with its inlet opening approximately one to two feet below the groundwater level and contaminated water was extracted to the surface. The water was extracted under a partial vacuum using a SUTORBILT3L blower capable of producing a vacuum of 10 inches of mercury in the extraction pipe at the inlet opening sufficient to cause water to be drawn up to the surface.

[0072] The extracted groundwater was conducted through an ARTX Model 15008 air amplifier having an inlet diameter of about 2 inches and an outlet diameter of about 1.25 inches. A 25 cfm flow of compressed air was injected into the groundwater extract as it passed through the throat of the air amplifier. The compressed air was injected at a pressure of about 80 psig and a temperature of about 80° F. As the air/groundwater mixture exited the air amplifier, the mixture passed through a misting chamber wherein turbulence and misting resulted in a substantial portion of the dissolved contaminant MtBE being stripped from the groundwater, passing into the gaseous phase.

[0073] The air/groundwater mixture was then separated using a converted 500 gallon liquid-vapor separator. The resultant liquid phase was collected in 55 gallon drums. The vapor phase was passed through a 55 gallon drum of activated carbon to remove the volatile contaminant vapors via adsorption. The vapors were then discharged to the atmosphere.

The same logic applies to:

In this case, the primary reference, Rentschler, requires a countercurrent flow of relative to liquid, meaning that the gas flows opposite the liquid stream being processed. Applicants' system is completely contrary to this. Applicants purposefully seek to act on a concurrent two-phase flow. See Claim 21, in particular.

The four jacks cited above, each operate differently, yet, and perform the same function - to lift a vehicle. Likewise, the strippers of Rentschler and Cheng (for example) operate differently, but perform the same function – to remove a gas from a liquid. Accordingly, their substitution is obvious.

Additionally, it is argued:

The stripper of Cheng does not separate and divert the gas phase from the liquid phase into two output streams, and would require further vessels, such as those taught in the present application, to achieve such separation. If the modification proposed in the office action were to be made, one would have to modify Rentschler over and above what is disclosed in either Rentschler, Cheng, or the alleged admitted prior art in order to achieve a system of bringing up and treating a deliberate two-phase flow of VOC-contaminated groundwater, and the principle of operation of the Rentschler device would have to be dramatically and non-obviously altered. The only way to combine Rentschler, Cheng, and/or the alleged admitted prior art is through the use of impermissible hindsight after gaining knowledge of the Applicants' application. Accordingly, Applicants respectfully urge the Examiner to withdraw all rejections and to reconsider and allow all pending claims.

Both Cheng and Rentschler disclose stripping devices to separate dissolved gases from liquids. As Applicants have admitted, "conventional 'knockout' vessel[s] or drum[s]" are known in the art. One need not elaborate on that which is known in the art. The use of a conventional knockout vessel would have been obvious since the clear goal of Cheng was to separate the phases.

Response to Amendment

The amendment filed **September 20, 2007** is objected to under 35 U.S.C. 132(a) because it introduces new matter into the disclosure. 35 U.S.C. 132(a) states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows: the identification of the two previously unlabeled squares as ***“treatment vessels.”*** Applicant is required to cancel the new matter in the reply to this Office Action.

Drawings

The changes to **Figure 1 of September 20, 2007** are **Disapproved** for the reason immediately above. The boxes therein, labeled 70 and 72 were never identified in the original disclosure. The change to **Figure 2 of July 24, 2008** is **Approved**.

Conclusion

All claims are drawn to the same invention claimed in the application prior to the entry of the submission under 37 CFR 1.114 and could have been finally rejected on the grounds and art of record in the next Office action if they had been entered in the application prior to entry under 37 CFR 1.114. Accordingly, **THIS ACTION IS MADE FINAL** even though it is a first action after the filing of a request for continued examination and the submission under 37 CFR 1.114. See MPEP § 706.07(b). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

**/Robert James Popovics/
Primary Examiner
Art Unit 1797**

Search Notes

Application/Control No.

10/828,843

Examiner

Robert James Popovics

Applicant

PERKINS, James A. et al.

Art Unit

1797

SEARCHED

Class	Subclass	Date	Examiner

INTERFERENCE SEARCHED

☐ PGPUB search conducted; search logic is attached.

Date: _____ Initials: _____

**SEARCH NOTES
(INCLUDING SEARCH STRATEGY)**

	DATE	EXMR
Text Search Conducted.	6-18-07	RJP
Text Search Conducted.	12-6-07	RJP
Text Search Conducted.	9-19-08	/RJP/